

Application Patterns



micro-23

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Designed in L^AT_EX

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API Composition

Service Discovery

Data Consistency

Transactional Management

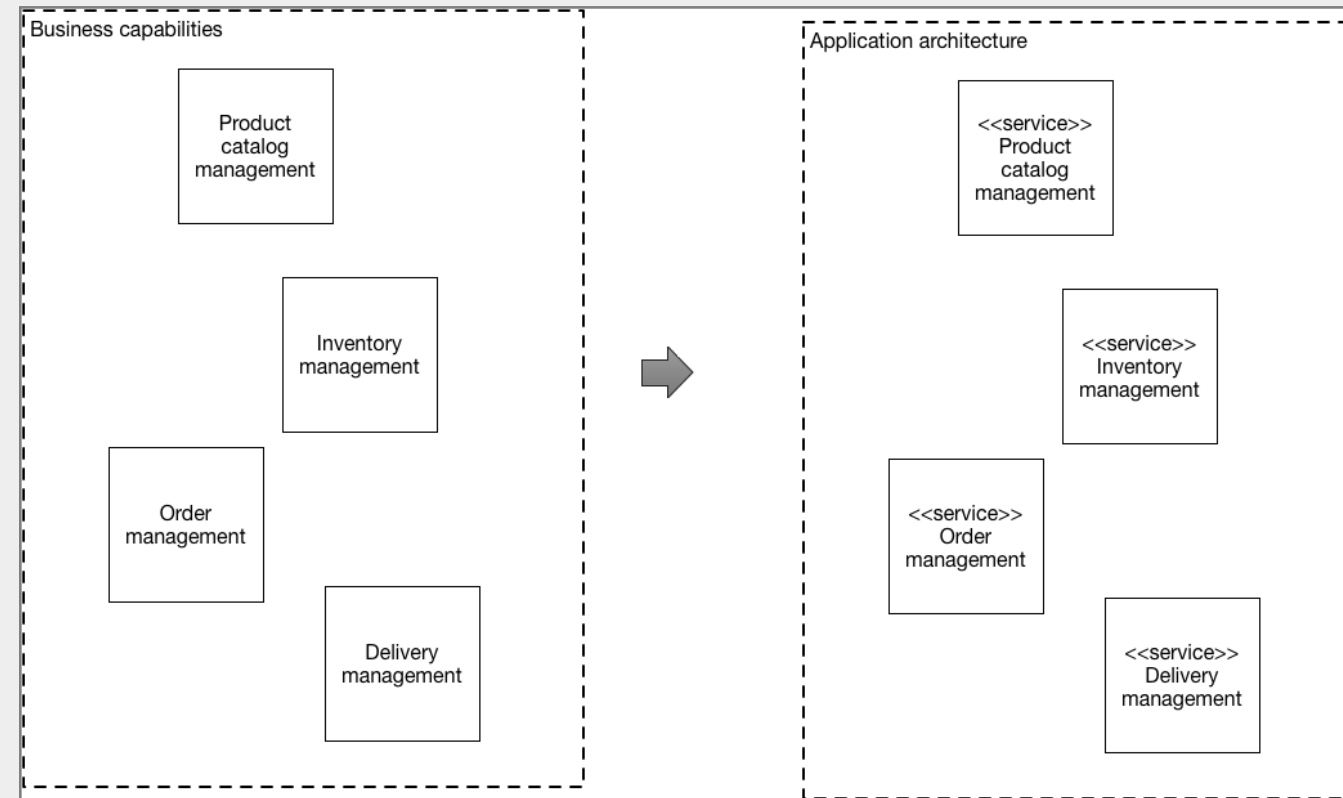
Reliability

Observability

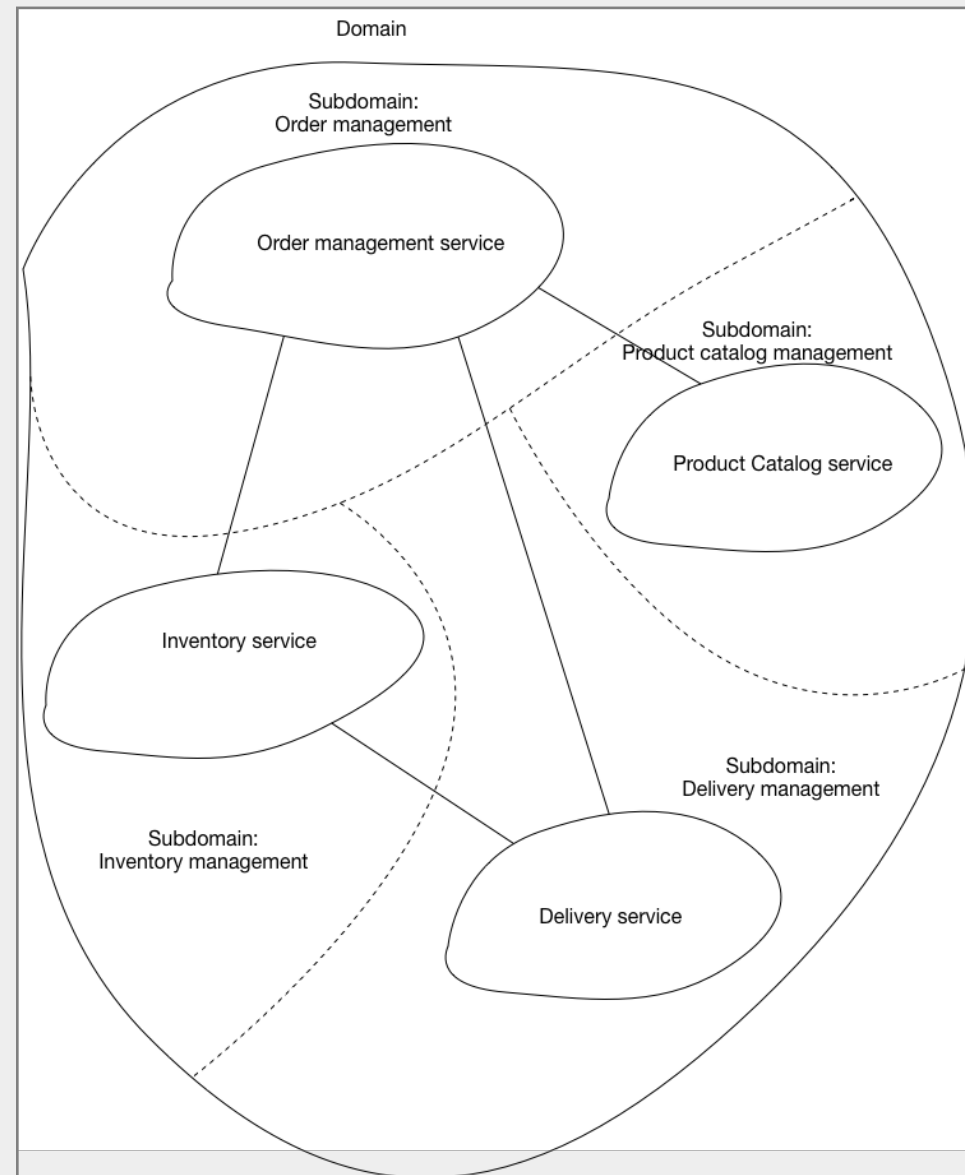
Chapter #1:

API Composition

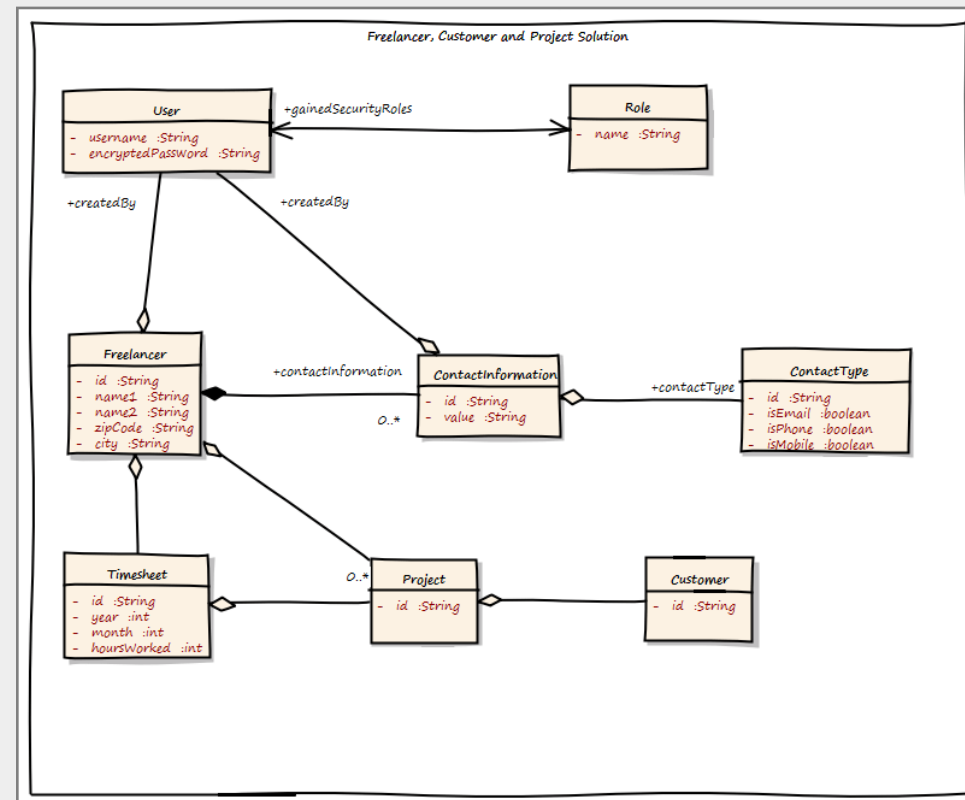
Decompose by Business Capability



Decompose by subdomain



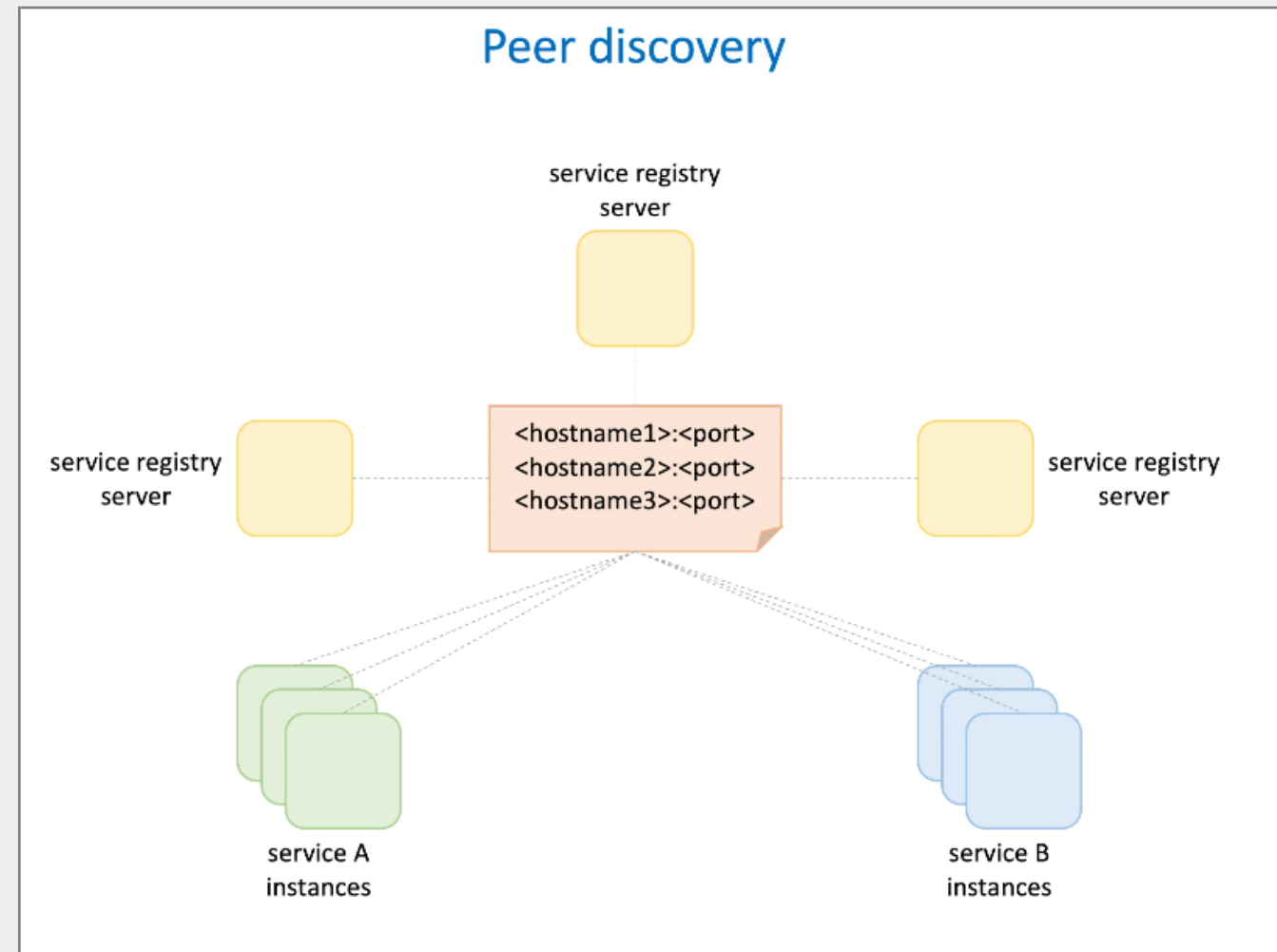
Domain Driven Design



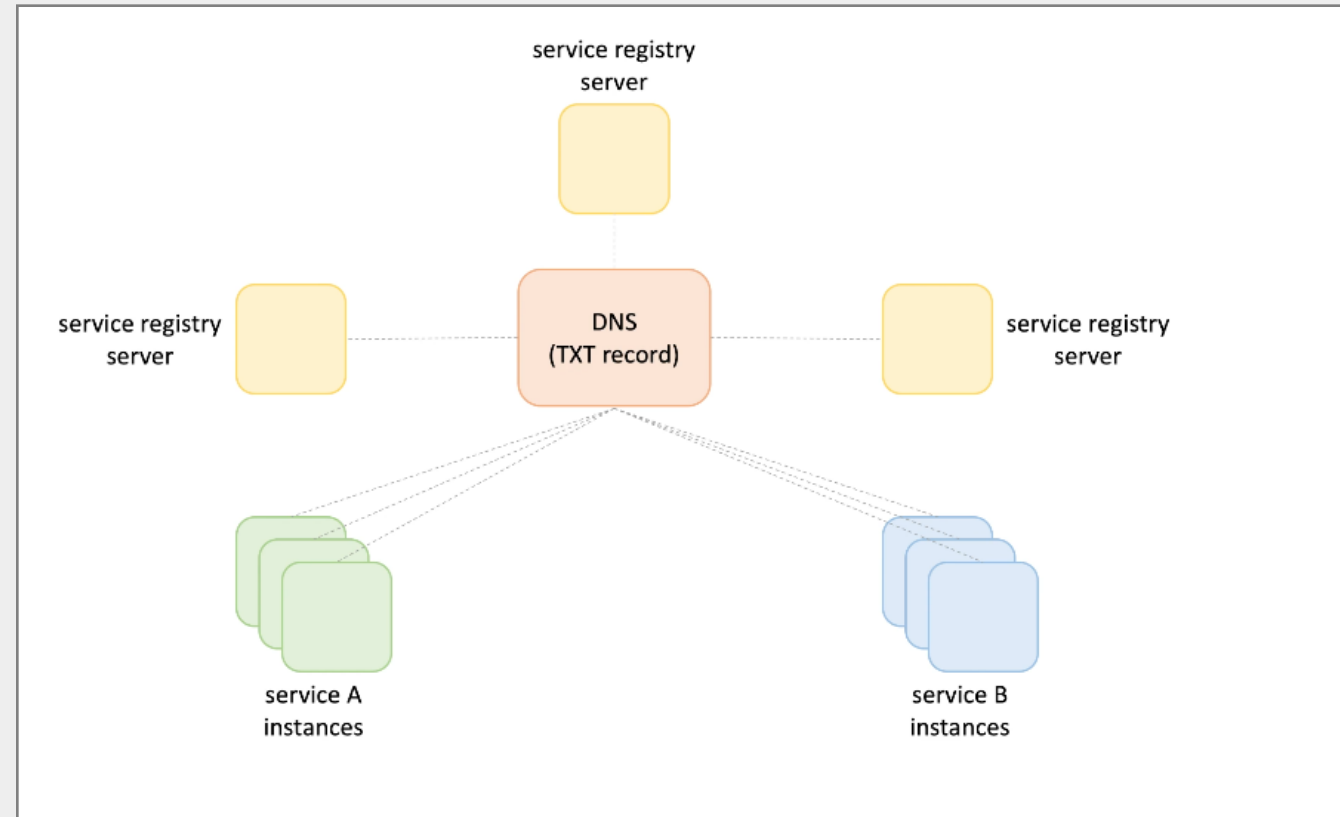
Chapter #2:

Service Discovery

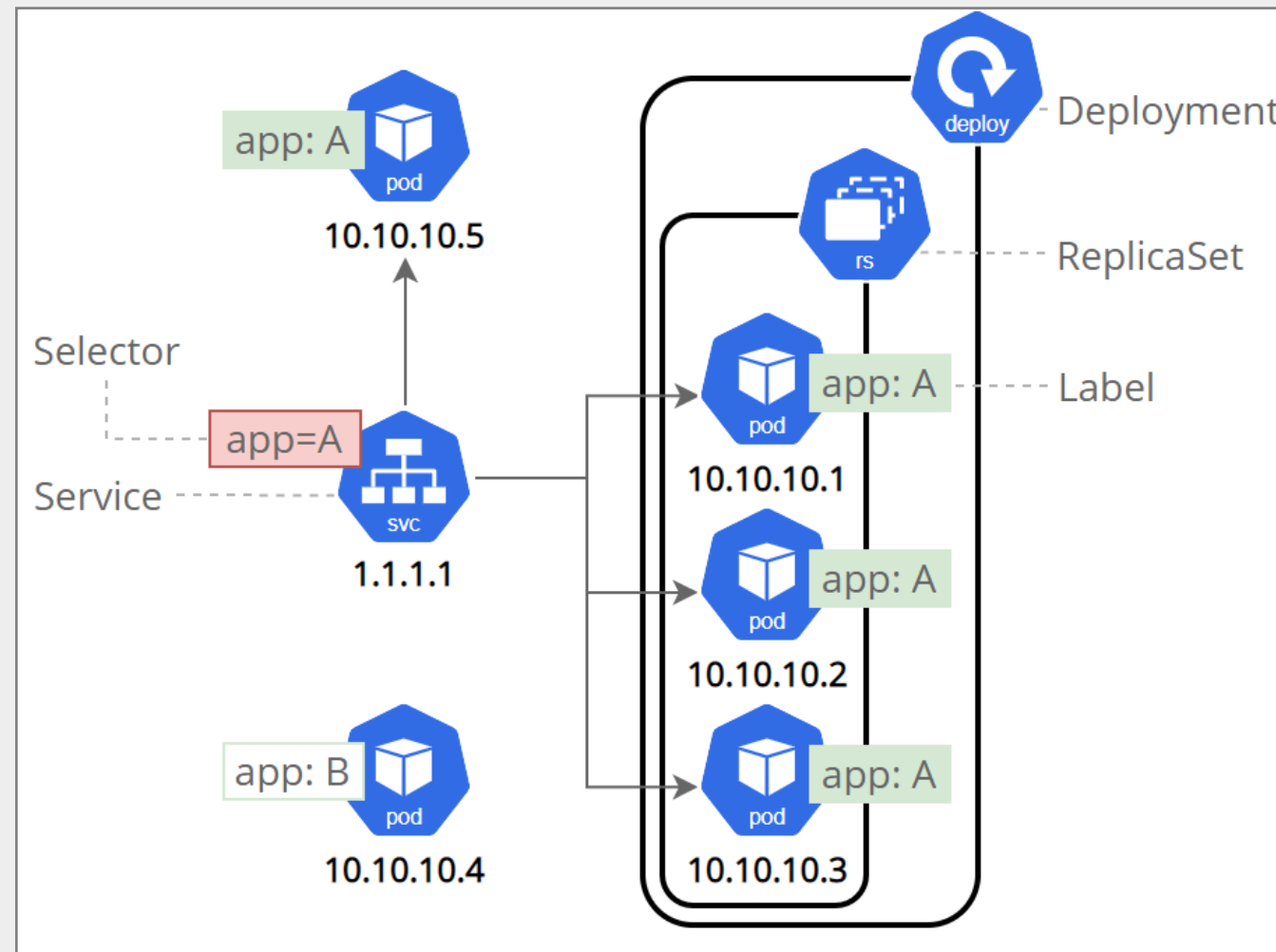
Apache Zookeeper



Spring Cloud Eureka



Kubernetes service registry



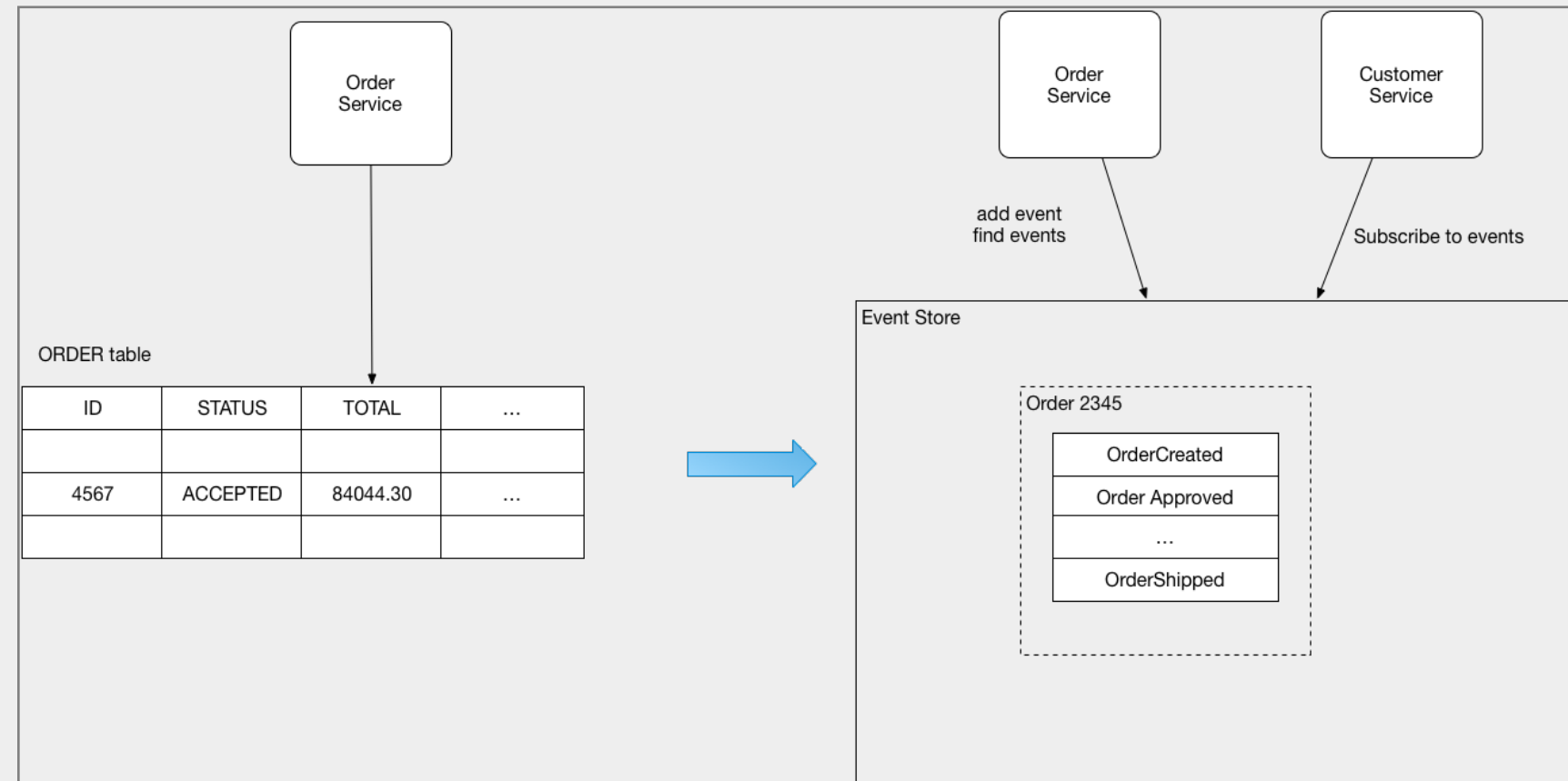
Self registration vs 3rd party registration

“A service instance is responsible for registering itself with the service registry. While a 3rd party registrar is responsible for registering and unregistering a service instance with the service registry.”

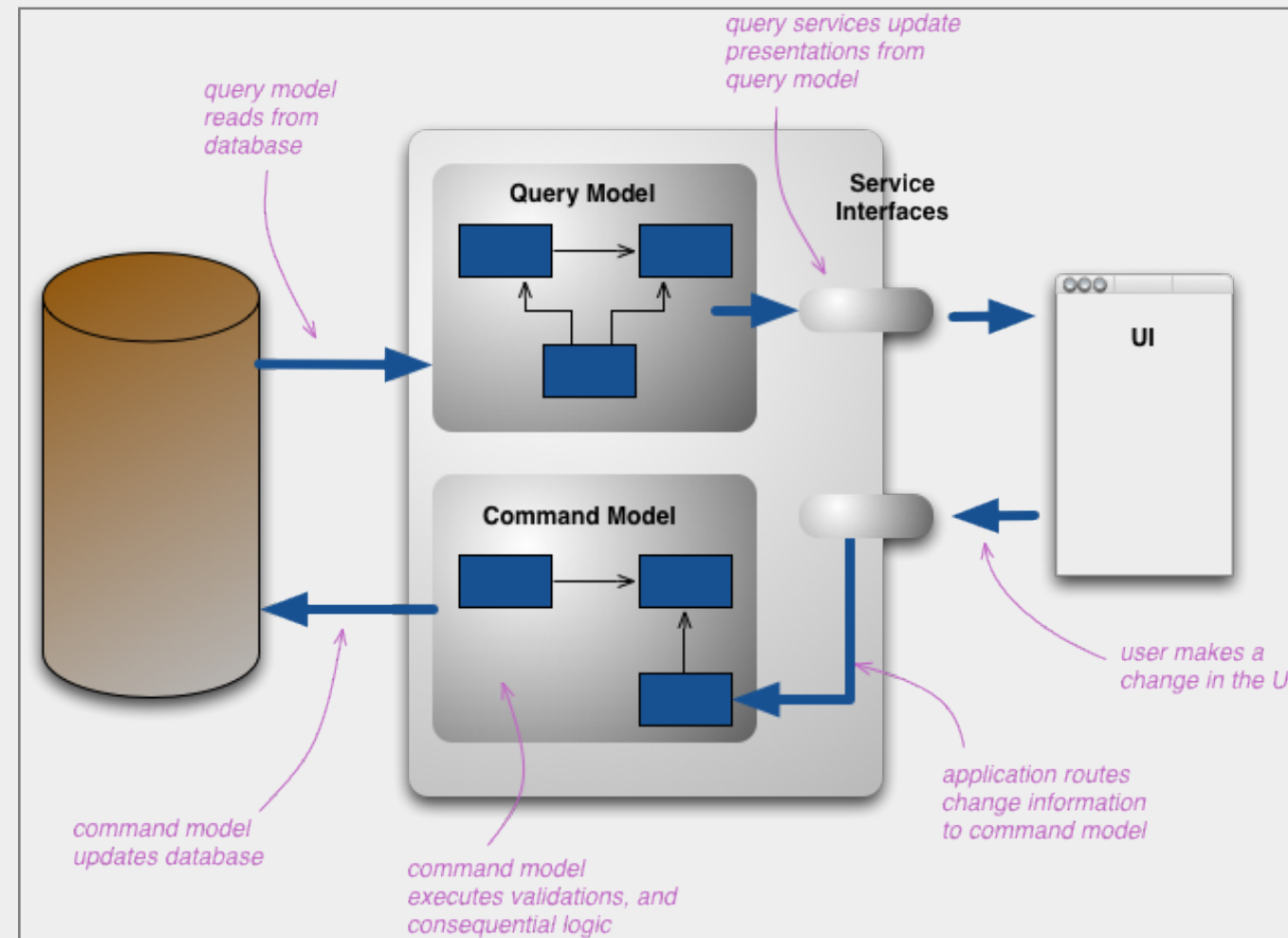
Chapter #3:

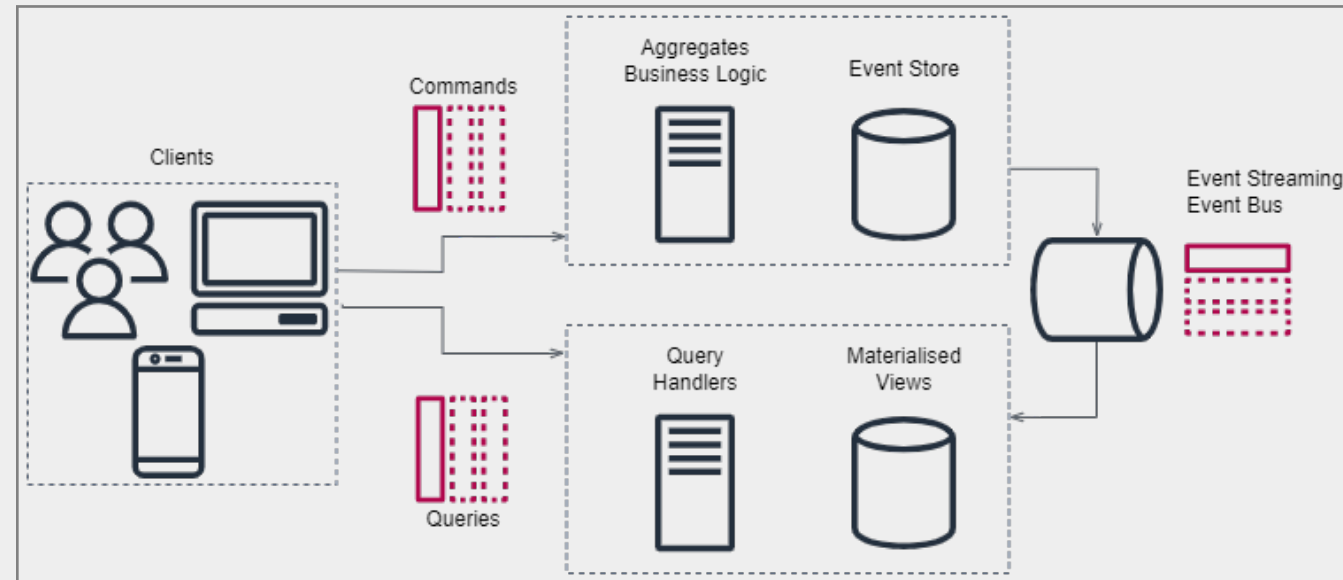
Data Consistency

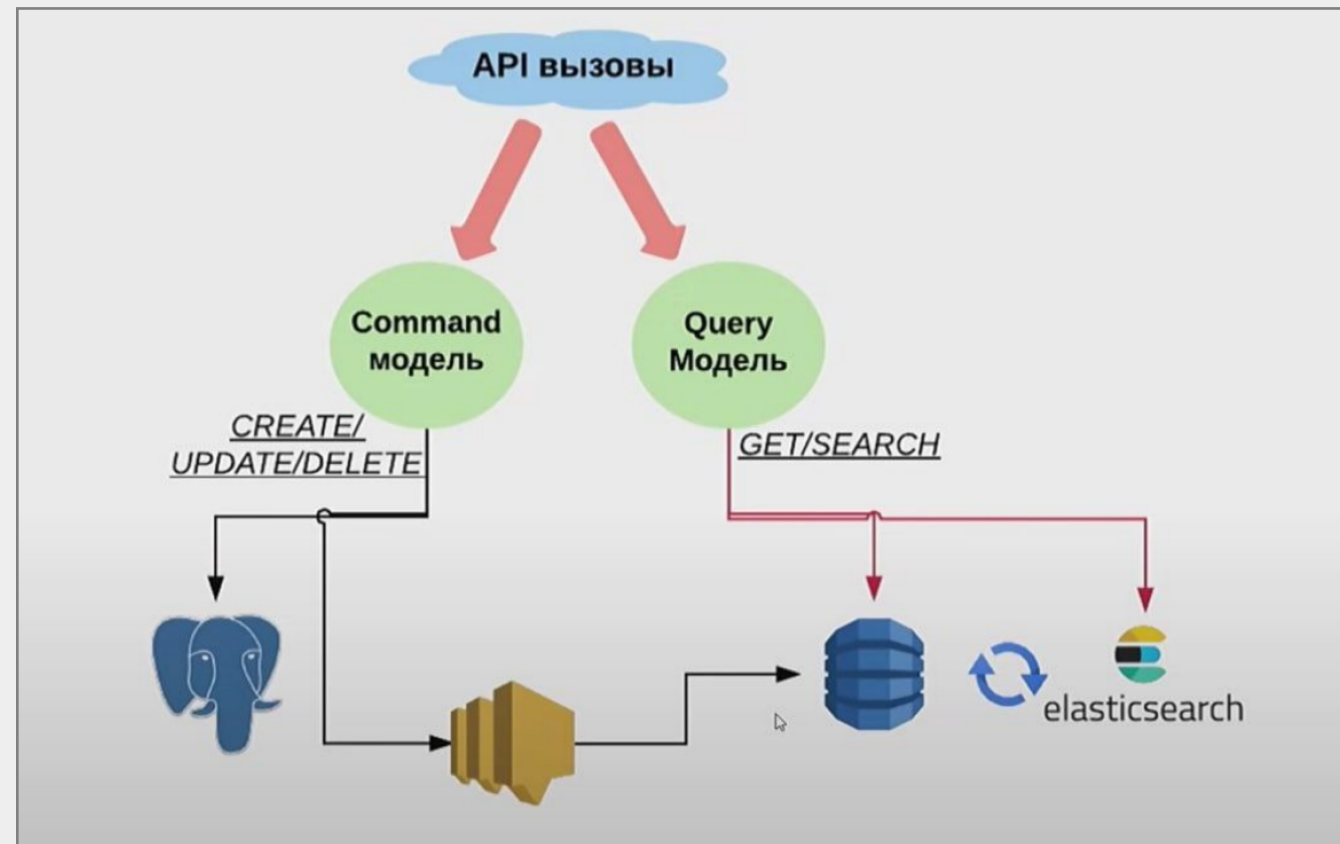
Event sourcing



Command Query Responsibility Segregation



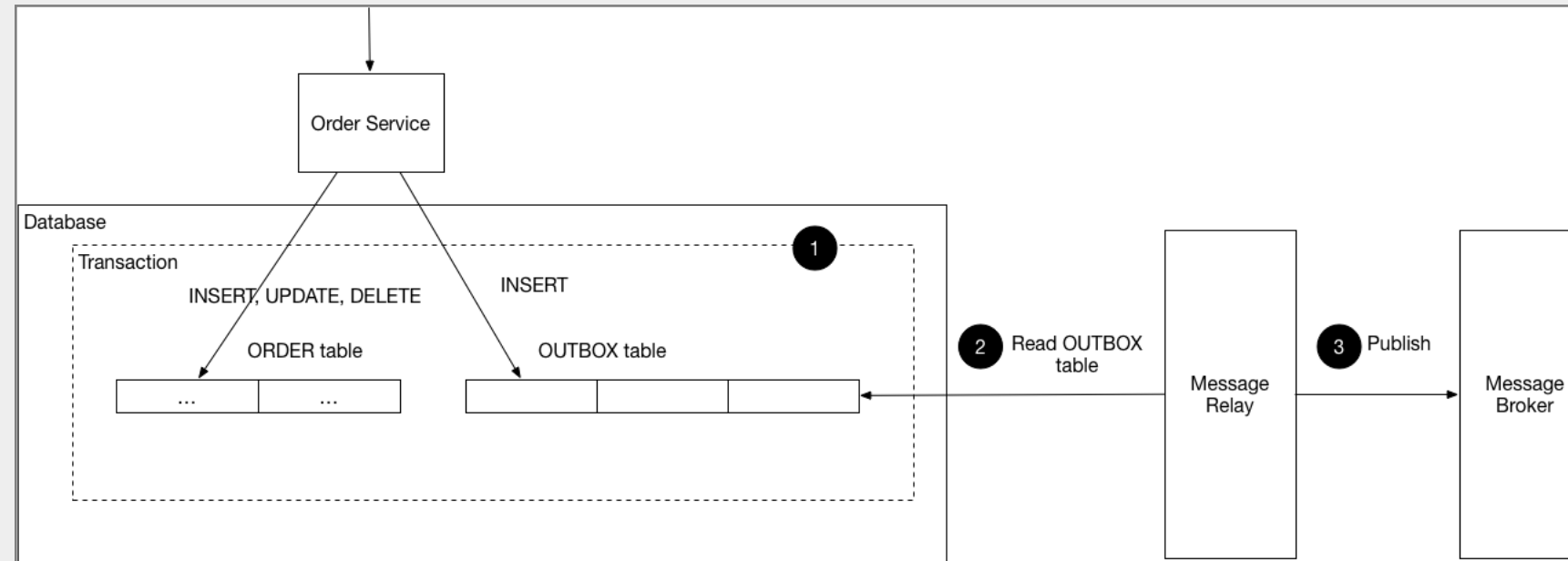




Chapter #4:

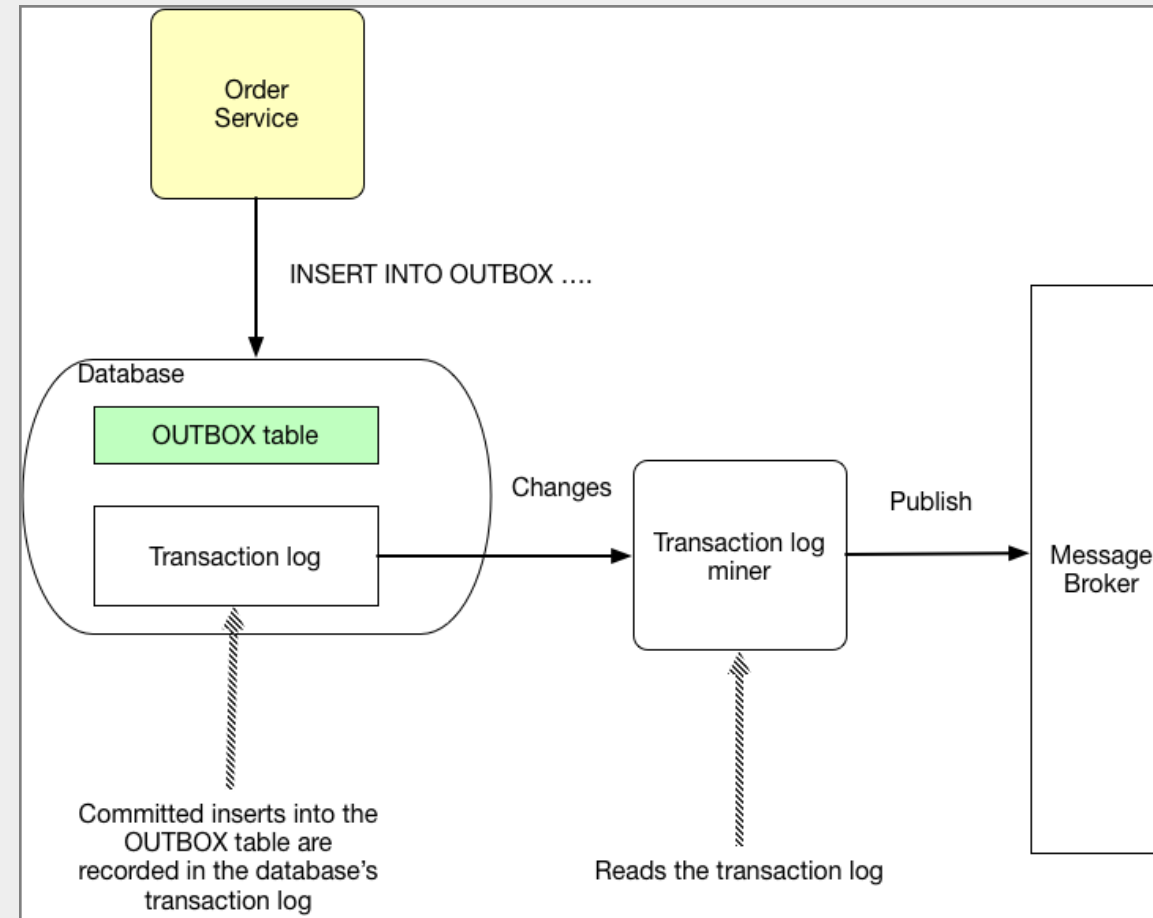
Transactional Management

Transactional Outbox

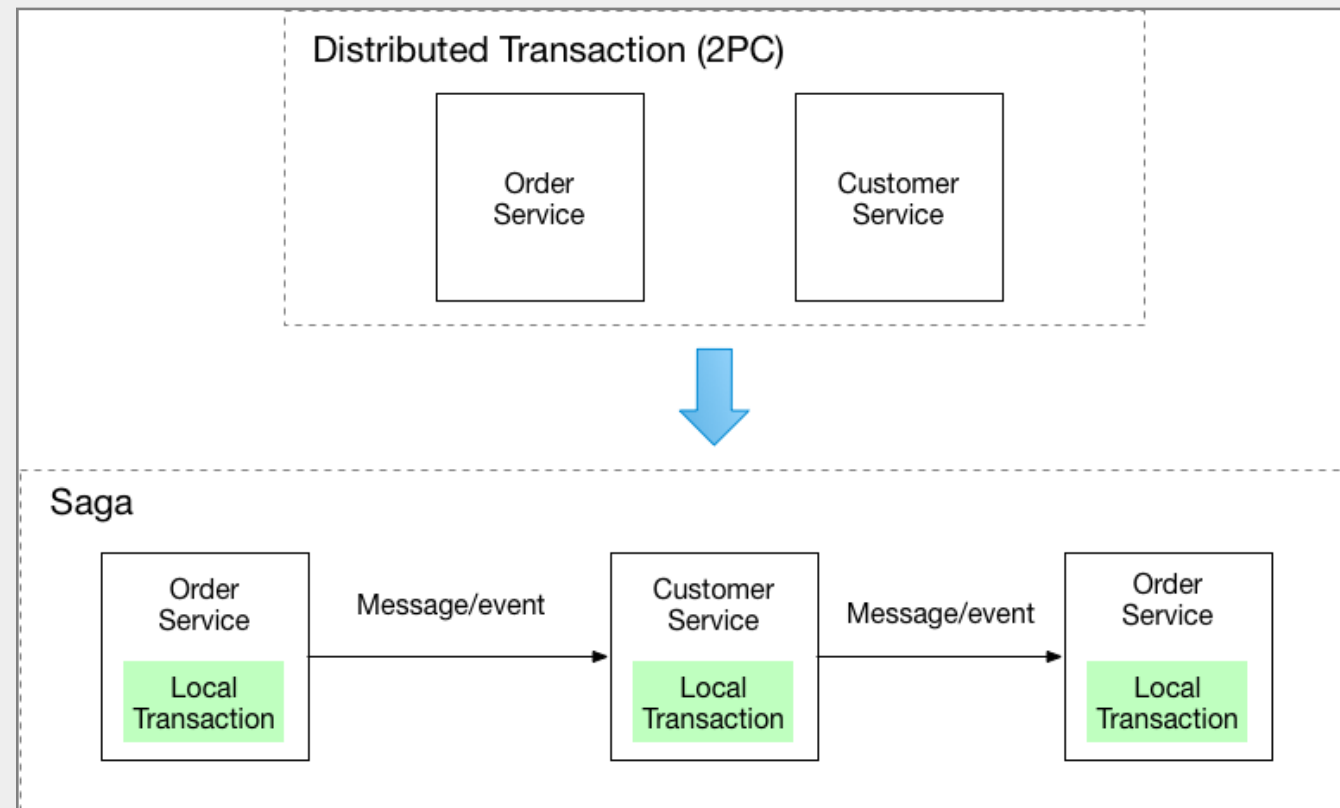


[Outbox Tailing Distributed]

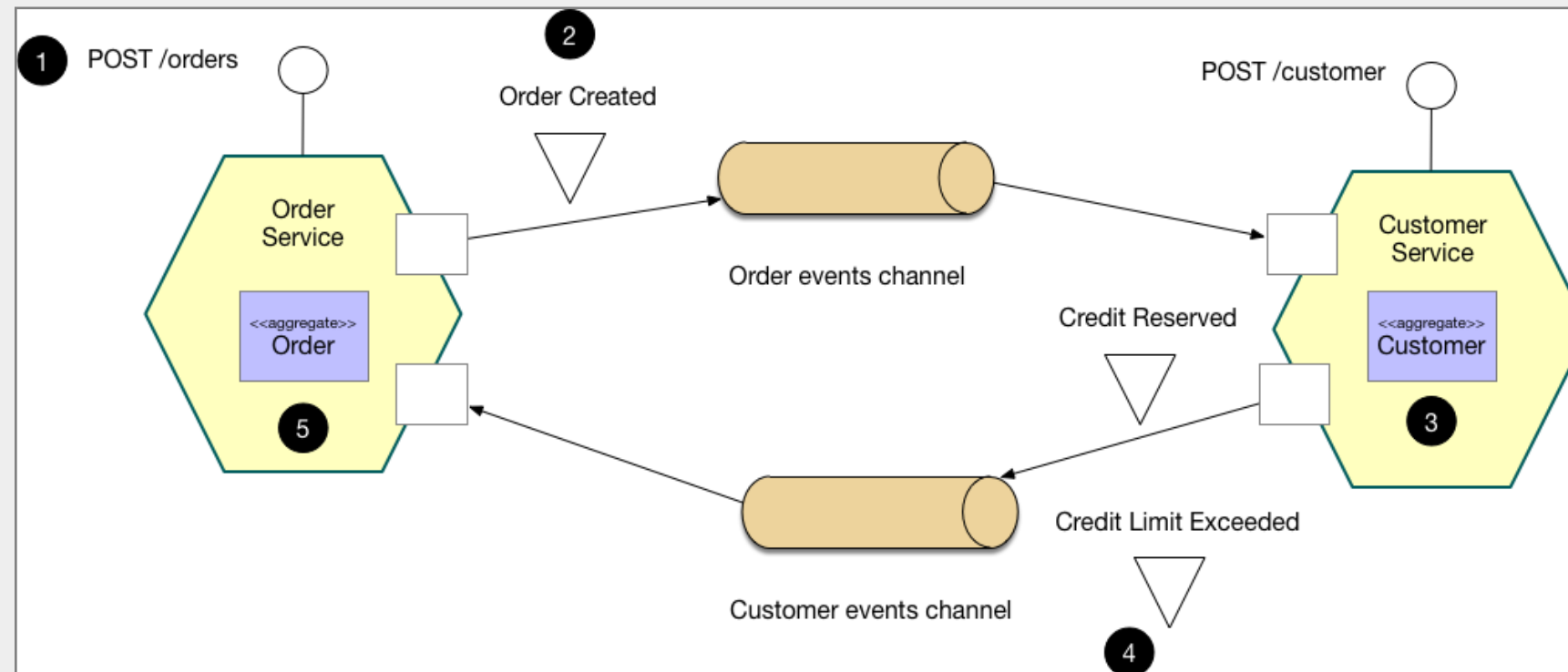
Log tailing



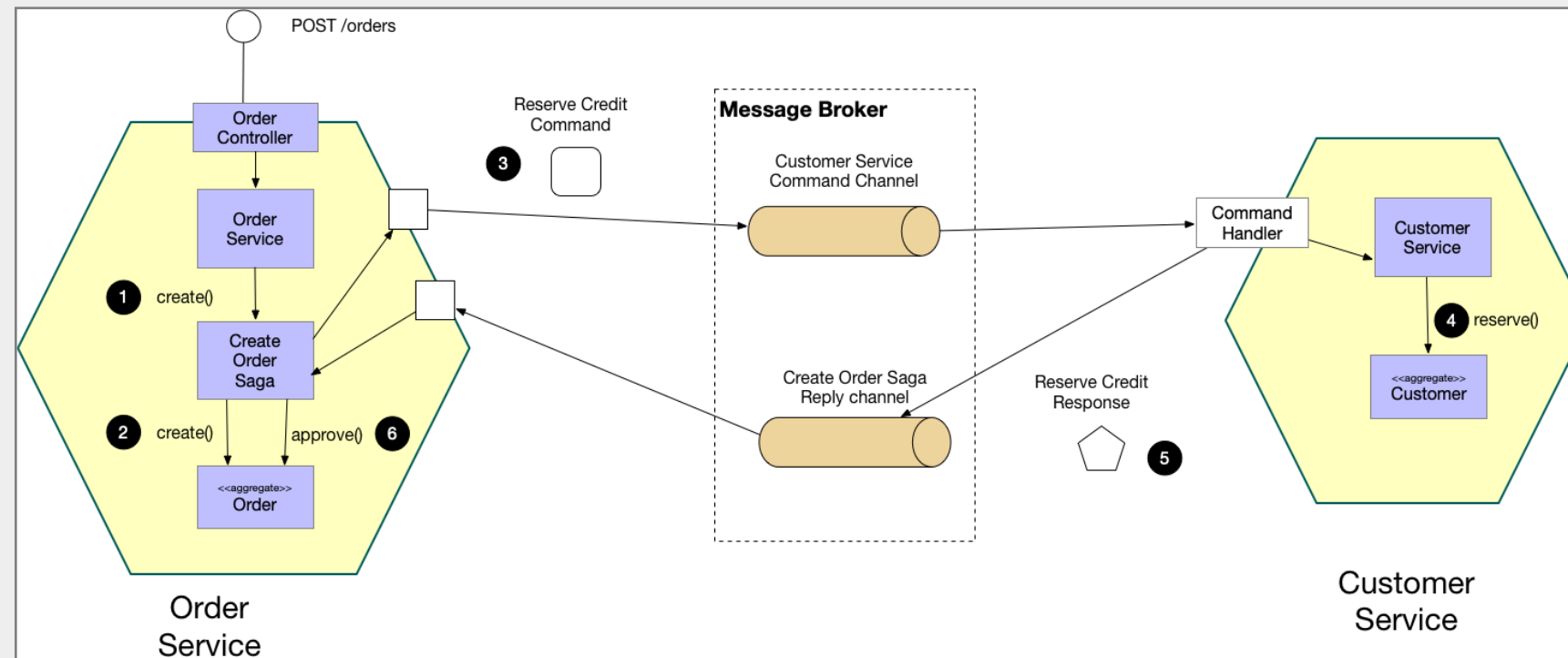
2 Phase Commit



Choreography-based saga



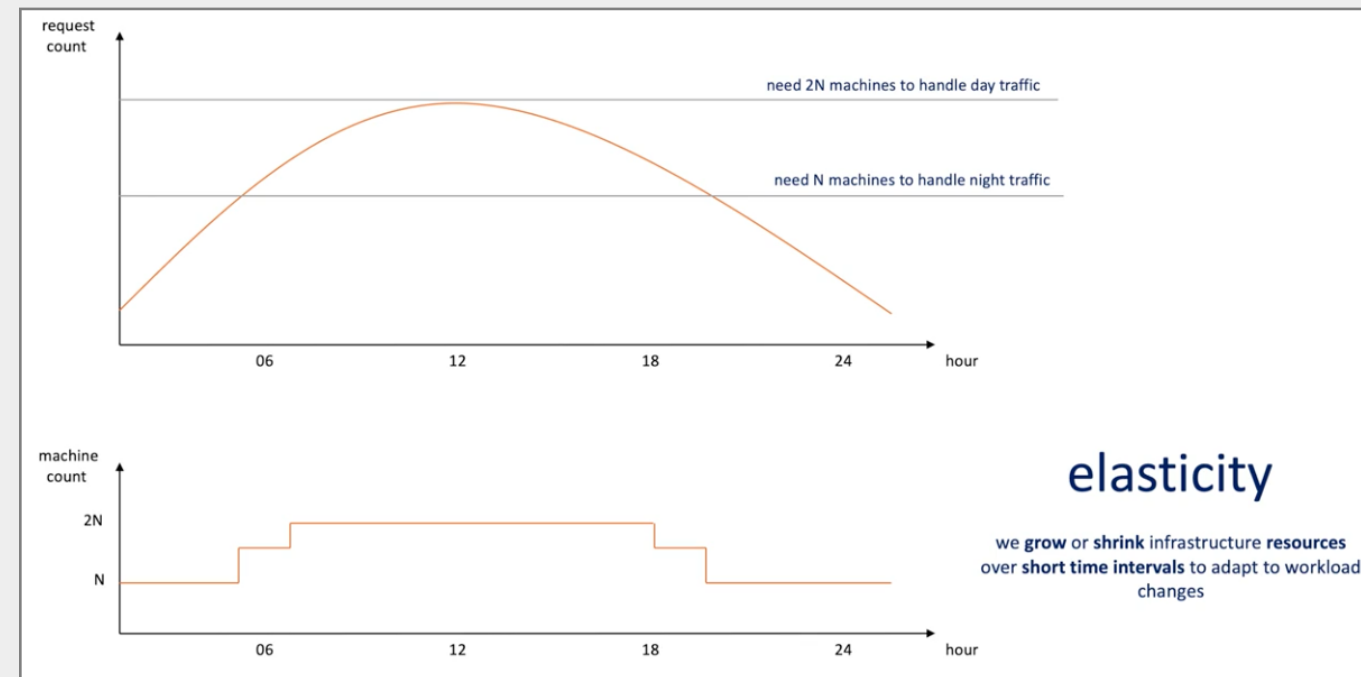
Orchestration-based saga



Chapter #5: Reliability

[Auto Shedding Limiting CB Bulkhead]

Autoscaling



Takes time to provision resources

[Auto Shedding Limiting CB Bulkhead]

Autoscaling policies

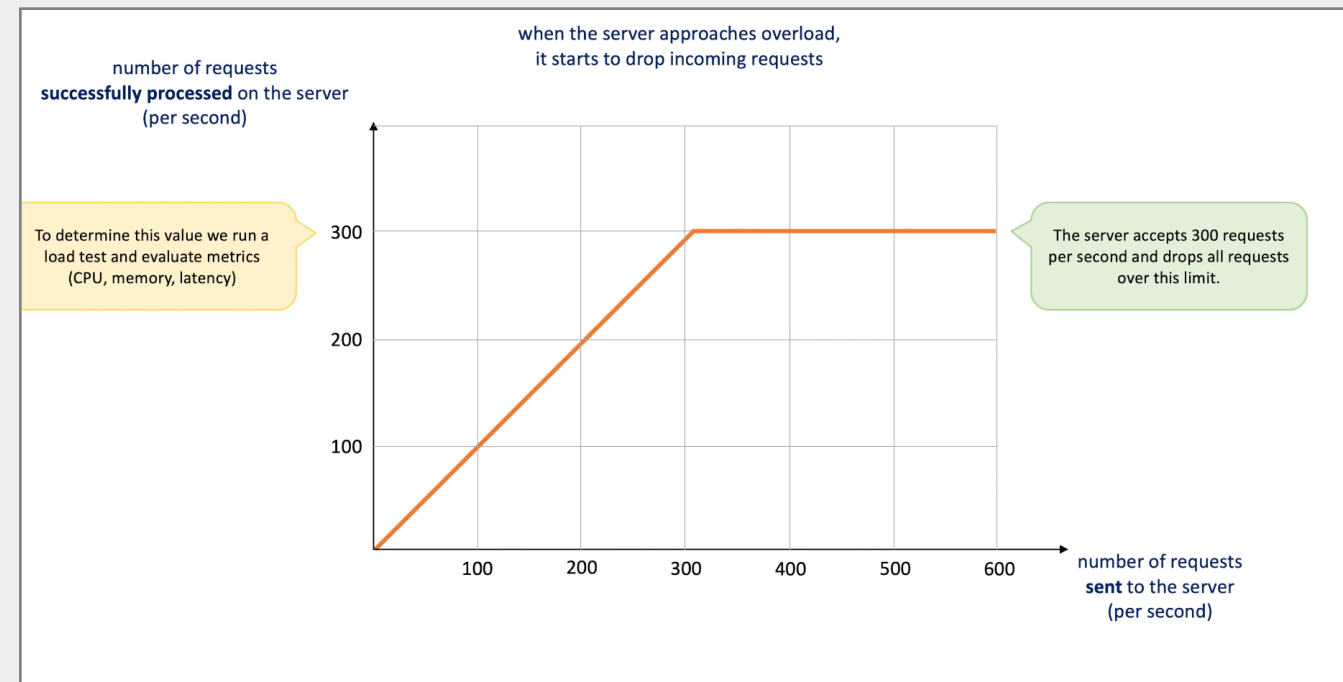
1. metric-based
2. schedule-based
3. predictive

Example

1. CPU util., Mem, Disk
2. Day/Night, business hours
3. CPU increase/decrease

[Auto Shedding Limiting CB Bulkhead]

Load shedding



Relys on the state of the system to make the decision

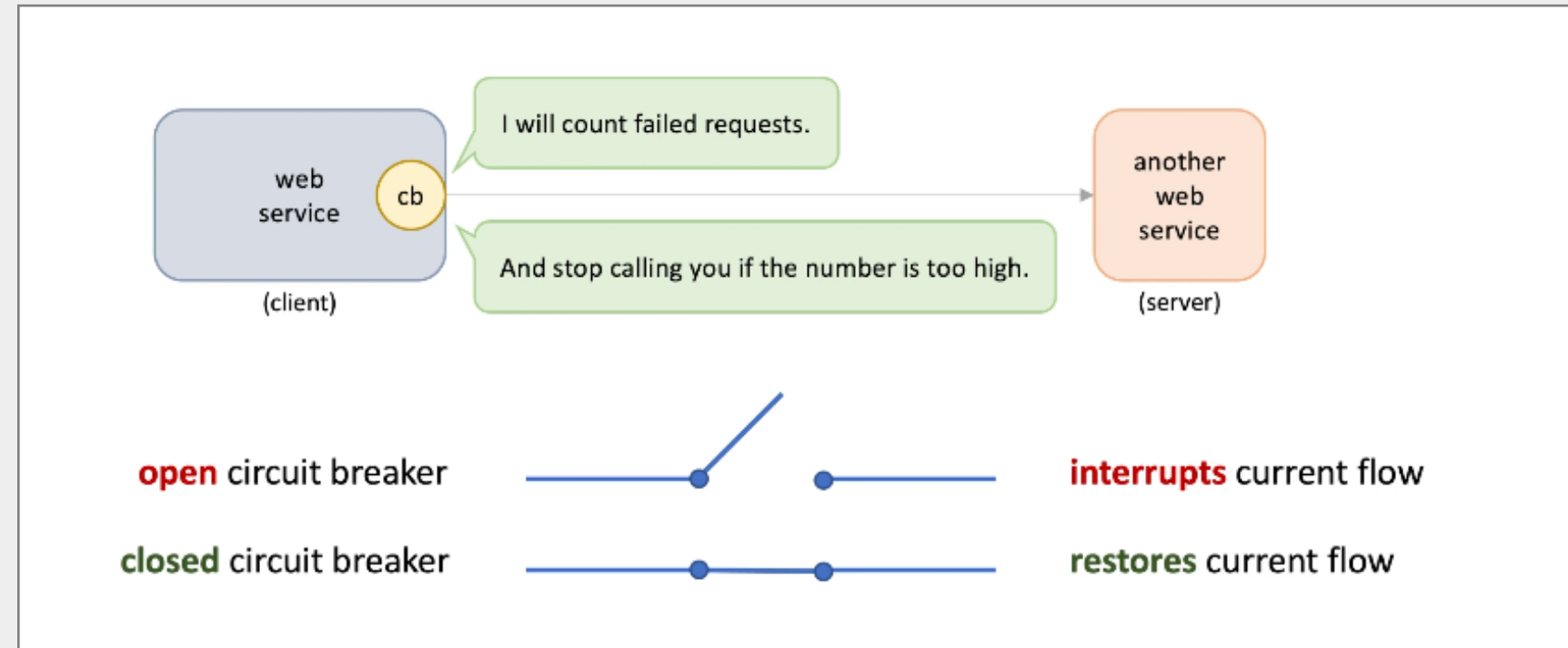
Rate-limiting

<https://aws.amazon.com/builders-library/fairness-in-multi-tenant-systems>

[https://yahooeng.tumblr.com/post/111288877956/
cloud-bouncer-distributed-rate-limiting-at-yahoo](https://yahooeng.tumblr.com/post/111288877956/cloud-bouncer-distributed-rate-limiting-at-yahoo)

[Auto Shedding Limiting CB Bulkhead]

Circuit breaker



We Configure

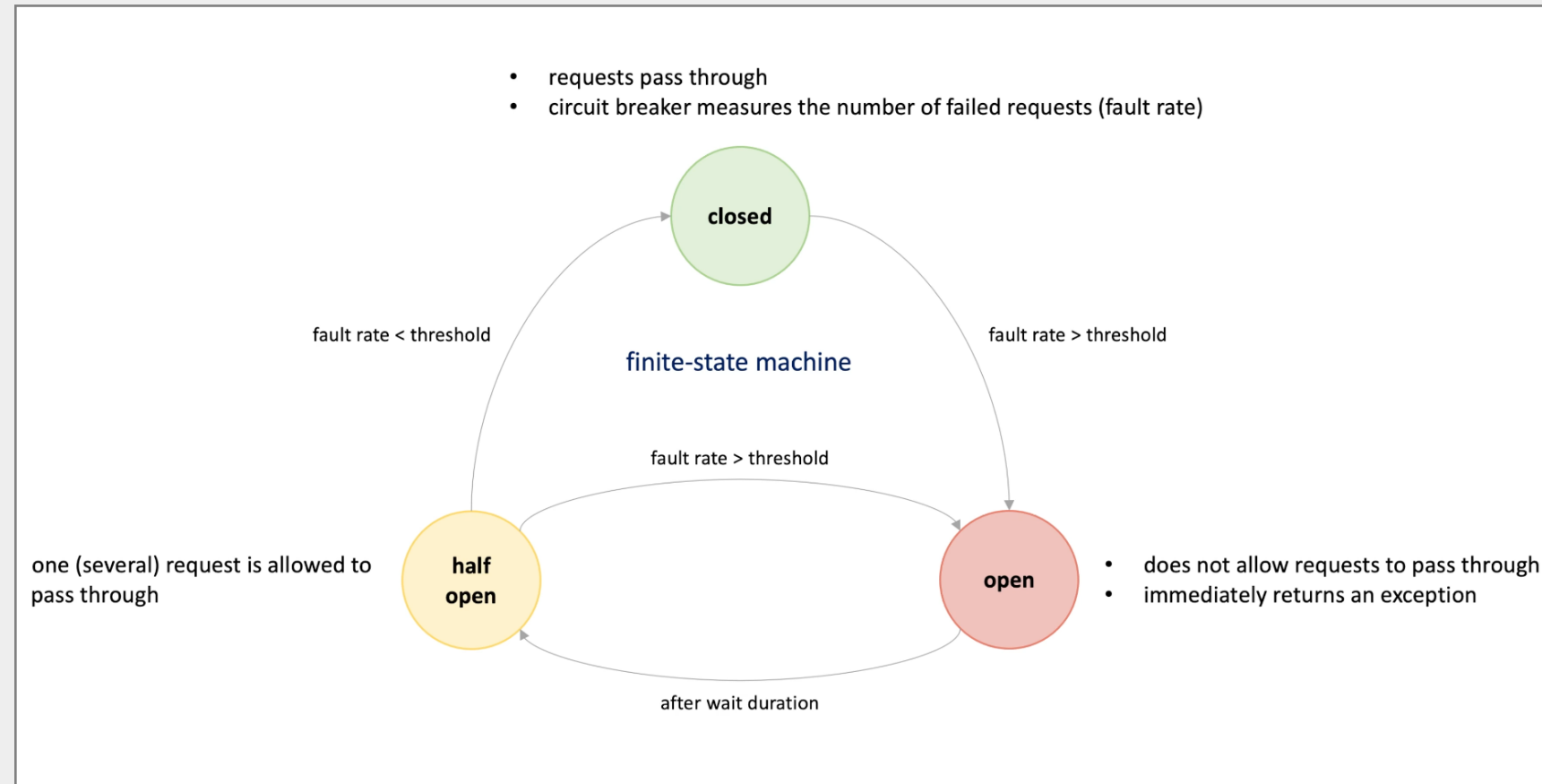
- Exception type
- Number of exceptions before circuit breaker opens
- How much time the circuit breaker remains open

Example

- TooManyRqException
- 5
- 1 min

<https://resilience4j.readme.io>

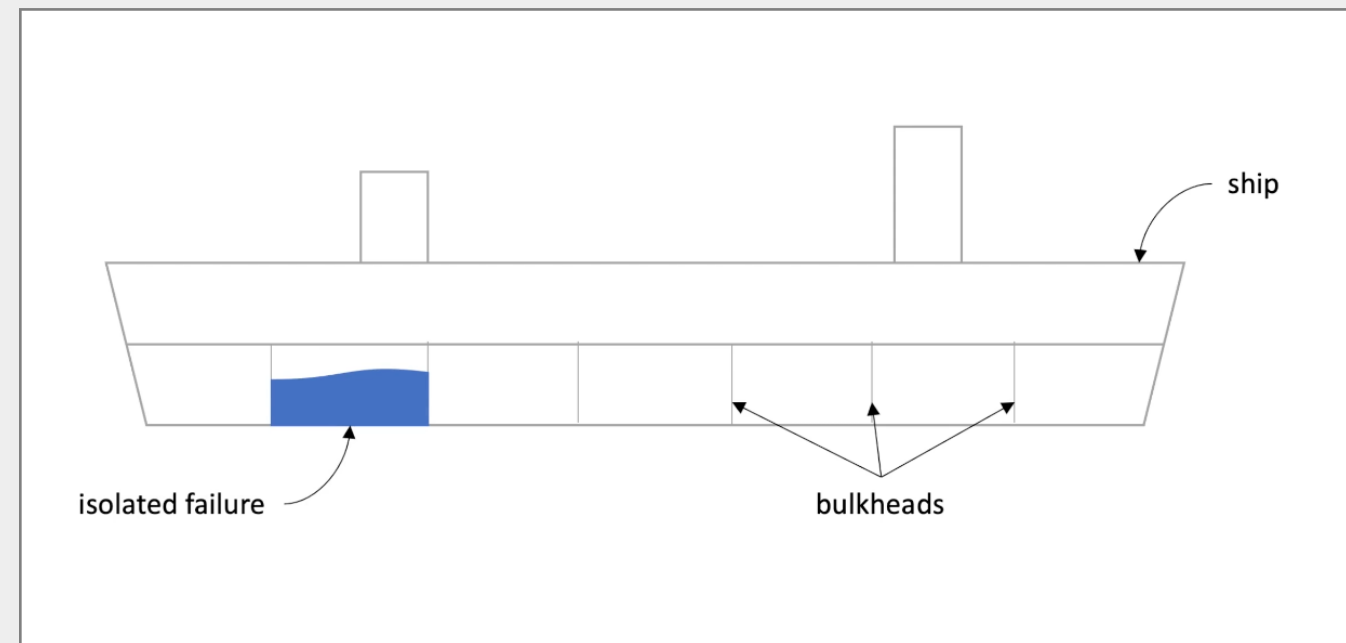
[Auto Shedding Limiting CB Bulkhead]



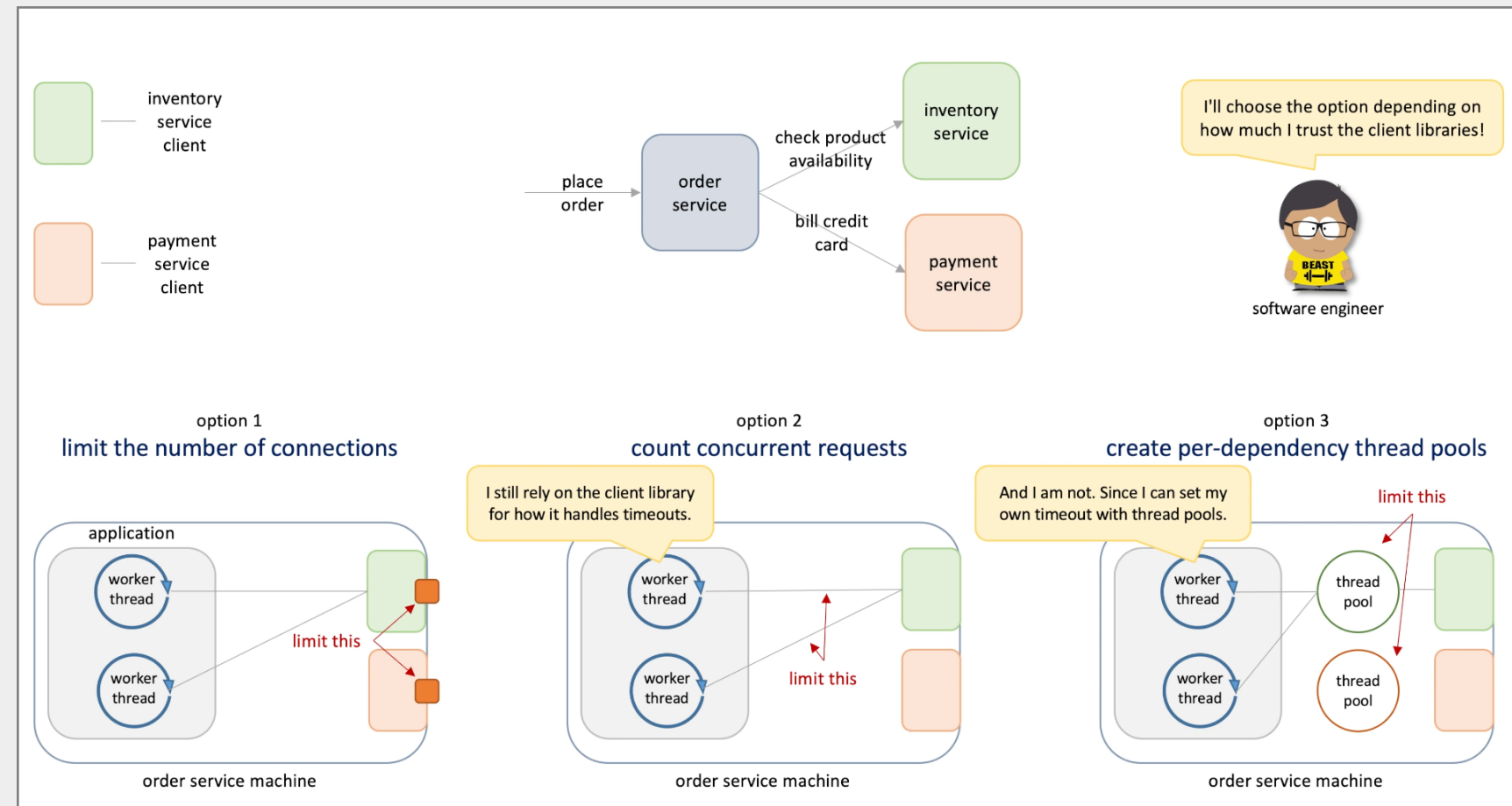
[Auto Shedding Limiting CB [Bulkhead](#)]

Bulkhead

Partition resources into groups of limited size and isolated groups



[Auto Shedding Limiting CB Bulkhead]

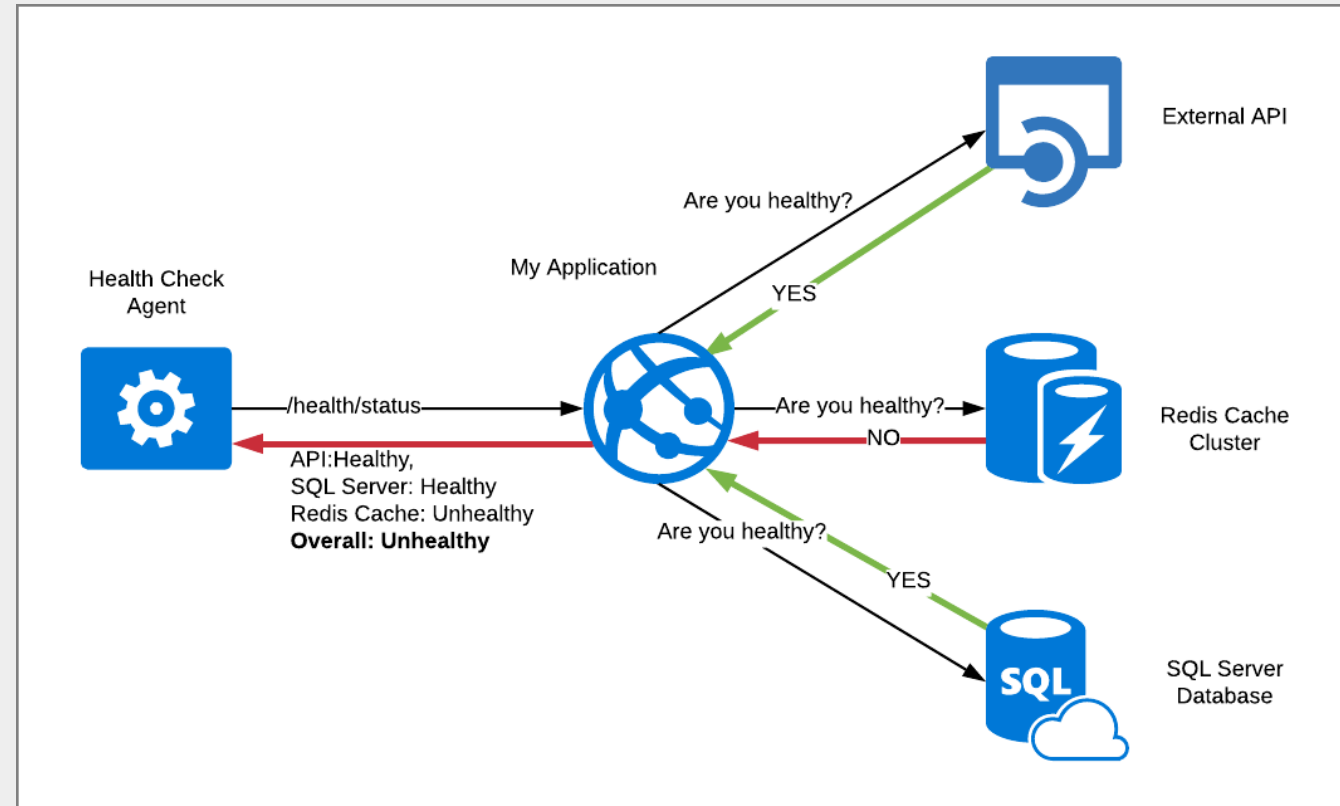


Chapter #6:

Observability

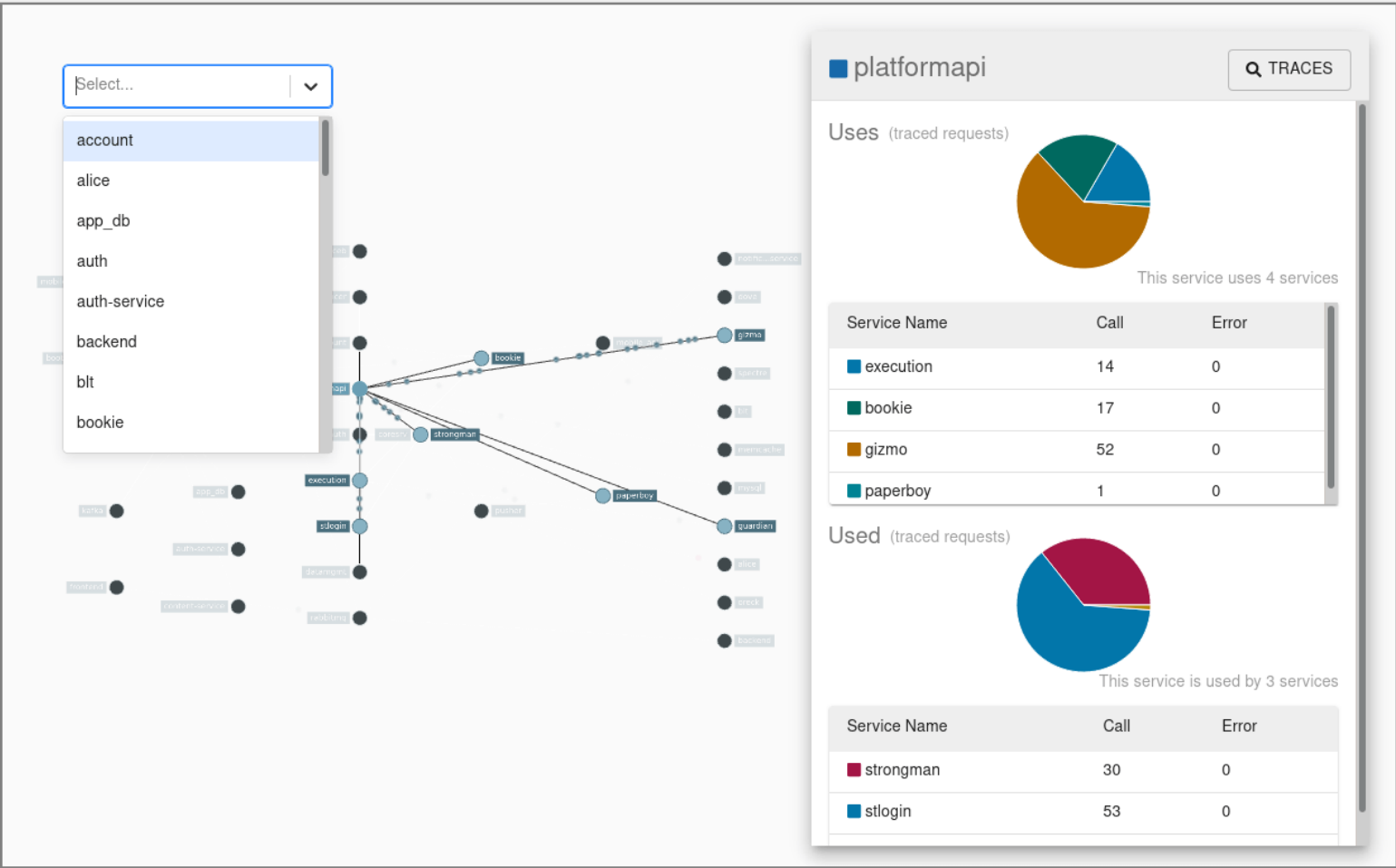
[Health Tracing Logs Exceptions]

Health checks



```
<dependency>  
  <groupId>org.springframework.boot</groupId>  
  <artifactId>spring-boot-starter-actuator</artifactId>  
</dependency>
```

Distributed Tracing



Centralized Logging

Centralized logging service is a service that aggregates logs from each service instance. The users can search and analyze the logs. They can configure alerts that are triggered when certain messages appear in the logs.

`https://aws.amazon.com/cloudwatch/`

`https://www.elastic.co/what-is/elk-stack`

Collect and store exceptions

`https://sentry.io/`